Sculpting the voice

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Vocal sounds are sculpted by humans and other animals by the movements of the vocal articulators – lungs, vocal folds (syrinx in birds), larynx, velum, jaw, tongue and lips. Therefore, understanding how vocalizations are generated and controlled requires understanding how the movements of the vocal articulators are generated and controlled. A theory of vocalization needs to be expressed within a general theory of movement - just as Kepler's laws of planetary motion are expressed within Newton's general laws of motion. We present a perceptuomotor theory of voice, based on General Tau Theory (Lee, 2009). The theory proposes that, in skilled vocalization, the motion-gaps in the articulator movements and in the resulting sound pressure waves are all tauG-guided, and therefore follow a specific mathematical formula. Spatiotemporal coordination of the tauG-guided movements of the articulators produces, through tau-coupling, the pattern of tauG-guided movements in the sound pressure wave. Quantitative tests of the theory will be presented, taken from human adult speech and singing, infant pre-speech, and animal vocalizations.

Reference

Lee, D. N. (2009). General Tau Theory: evolution to date. Special Issue: Landmarks in Perception. *Perception*, *38*, 837-858.